PRAXELIS CLEMATIDEA (ASTERACEAE), A GENUS AND SPECIES NEW FOR THE FLORA OF NORTH AMERICA

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ABSTRACT

Praxelis clematidea (Asteraceae) is a new genus and species for North America. *Praxelis* is compared with similar species, and their diagnostic characters are discussed.

RESUMEN

Praxelis clematidea (Asteraceae) es un género y especie nueva para América del Norte. Se compara *Praxelis* con especies parecidas, y se discuten sus caracteres diagnósticos.

Field work in central Florida by the second author has led to the discovery of a plant species new to North America, *Praxelis clematidea* (Griseb.) R.M. King & H. Rob. (Fig. 1). The species is native to Argentina, Bolivia, Paraguay, and Brazil (King & Robinson 1987). It is also erroneously reported from Venezuela (Waterhouse et al. 2003). It has been naturalized in Australia, China, and Hong Kong (Corlett & Shaw 1995; Veldkamp 1999; Waterhouse 2003). There are 13 additional species of *Praxelis* Cass., all restricted to South America, none of which are known as exotics elsewhere (King & Robinson 1987). A more complete description of *P. clematidea* is available on-line (U.S. Forest Service 2007), as are photos (Waterhouse et al. 2003), including comparison with the similar *Ageratum houstonianum* Mill. (Pollock et al. 2004).

Voucher specimen data: **UNITED STATES. Florida. Orange Co.:** 28°24'80"N 81°37'13"W (WGS84), NW of Kissimmee, on private property near the junction of Seidel Road with FL 429, abandoned ex-citrus grove (no citrus trees), herb ca. 2' tall, flowers pale purple, rare, 26 Jul 2006, *LeAnn White 1* [FLAS], det: S. Barry Davis (FLAS), Oct 2006, ver: John Pruski (MO), Mar 2007. **Orange Co.:** 28°24'9.7"N 81°37'11.5"W (WGS84), WSW of Orlando, SSW of Reedy Lake, near the Rapid Infiltration Basin Systems of the Reedy Creek Improvement District along Old Hartzog Road (gated), E of FL 429 and Bear Bay, W of Reedy Creek, accessed S off Seidel Road. Roadside and edge of pine plantation with *Bidens alba*, *Heterotheca subaxillaris*, *Lantana camara*, *Panicum maximum*, *Paspalum notatum*, and *Rhynchelytrum repens*, suffrutescent herb to ca. 1.3 m tall, usually with several branches from the base, with very strong smell (musky, cat-spray like), flowers pale pinkish purple, locally abundant, forming a large patch with hundreds of stems, 17 Jul 2007, *J. Richard Abbott 22887, with Tim Burns & Melissa Clark* [B, FLAS, G, GH, HBG, IJ, K, L, LD, M, MAD, MAPR, MEXU, MICH, MIN, MO, MSC, MT, MU, NY, PH, S, TEX, U, US, USCH, WU, Z]. **Orange Co.:** 28°26'56.9"N 81°35'46.6"W (WGS84), SW of Orlando, SE of Lake Hancock, NW corner of Lake Hancock Road at junction with Reams Road to S and Ficquette Road to N, accessed E of FL 429 on Seidel Road, which then turns N & E and becomes Lake Hancock Road. Roadside with *Bidens alba*, *Cyperus rotundus*, *Eupatorium capillifolium*, *Heterotheca subaxillaris*, *Paspalum notatum*, *Sida rhombifolia*, and *Urena lobata*, forming a large patch with ca. 50 plants here, 17 Jul 2007, *J. Richard Abbott 22888*,

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with Melissa Clark [BM, BRIT, C, CAS, CICY, CONN, DAV, DUKE, E, EIU, F, FLAS, FSU, FTG, GOET, JBSD, LSU, MO, PIHG, SEL, UC, GA, UPRRP, USF, UWFP, W] and 8 Mar 2008, *J. Richard Abbott 24194* [FLAS]..

Praxelis clematidea: herb to suffrutescent shrub to ca. 1.3 m tall; stems soft pubescent (densely villous to hirsute, especially above); petioles usually very short, well less than 1/4 the blade length (except on the lowest leaves which may have petioles up to ca. 1/3 or more the blade length; these leaves are often gone by the time the plant is in fruit); blades ovate, rounded to cuneately narrowing at the base, generally about half (or more) as wide as long; margins irregularly toothed, i.e., some teeth nearly dentate, others more sharply serrate, with size variation even on same leaf; heads cylindrical-campanulate, clearly longer than wide (ca. 3–4 mm wide, 6–8 mm tall), in lax to dense clusters; phyllaries about 1 mm wide, flat, densely imbricate, although deciduous in fruit, with conspicuous dark striations from the veins.

A visit to the region on 17 July 2007 discovered hundreds of individuals of *Praxelis* at several scattered localities, all disturbed roadsides. This local abundance in so many different spots, in conjunction with the original collection in a relatively remote and inaccessible area, suggests that *Praxelis* has been in Florida for some time and has been spreading. The site where the species was first found in July 2006 is an open old field dominated by exotics [*Rhynchelytrum repens* (Willd.) C.E. Hubb.; *Richardia brasiliensis* Gomes; on edges, *Urena lobata* L.] and 'weedy' natives [*Cenchrus spinifex* Cav., *Heterotheca subaxillaris* (Lam.) Britton & Rusby, *Bidens alba* (L.) DC.]. The site is a dry, well-drained sandy upland that was once a citrus grove. Although there are no indisputable indicators of the original vegetation, sparse remnants suggest that it may have been sandhill vegetation, e.g., *Commelina erecta* L., *Croton glandulosus* L., *Galactia elliottii* Nutt., *Opuntia humifusa* (Raf.) Raf., *Passiflora incarnata* L., *Quercus myrtifolia* Willd. (only 1 plant seen), and, along the edges, *Euthamia caroliniana* (L.) Greene ex Porter & Britton and *Verbesina virginica* L. The area is now mostly surrounded by dry pine woods that appear secondary, with a remnant swampy baygall nearby to the southwest. The site has about 200 Florida gopher tortoises (*Gopherus polyphemus*) and a density of about 29.1 tortoises/ha, which is very dense for gopher tortoise populations. *Praxelis* was completely absent on a follow-up trip on 5 November 2006, at which time the site was also seen to be heavily disturbed by hog rooting (*Sus scrofa*). One small patch was rediscovered in the same area during a follow-up visit on 23 August 2007, making it clear that the species is established at the site. A follow-up trip on 8 March 2008 to the Lake Hancock Road site found that, as part of a road construction project, the population had been nearly eradicated (although achenes are doubtless still persisting in the area); only one plant was seen (and it was in flower), with the remaining area covered in fresh sod. This did demonstrate that at least some individuals of *Praxelis* over-winter as above-ground perennials, flowering year-round (or nearly).

Eupatorieae are distinguished by the combination of discoid heads, anther bases non-tailed (obtuse, rounded, or truncate), styles usually more or less filiform, style-branch appendages usually terete to clavate, and leaves usually opposite (FNAEC 2006a). *Praxelis* keys to either *Fleischmannia* Schultz-Bip. or *Chromolaena* DC. in FNAEC (2006b), matching key features for both—ca. 20 unequal phyllaries (the outer ones are generally smaller), 25–30 florets per head, a 3–4 ribbed achene, a pappus of ca. 40 capillary non-plumose bristles, and a glabrous style base. *Praxelis* has been reported as an annual and a perennial (U.S. Forest Service 2007; Waterhouse et al. 2003) and may behave as either, depending on local climate. A modified key is provided here, based on species in North America that look most similar to *Praxelis clematidea*, i.e., other herbaceous traditional *Eupatorium* L. s.l. with petiolate, opposite leaves trinerved from base and bluish purple corollas. For certainty of identification in a broader taxonomic context in the absence of comparative herbarium material or consultation with a specialist, the best references are the keys and descriptions in Cronquist (1980), King and Robinson (1987), FNAEC (2006a, 2006b), or, for Florida, Wunderlin and Hansen (2003).

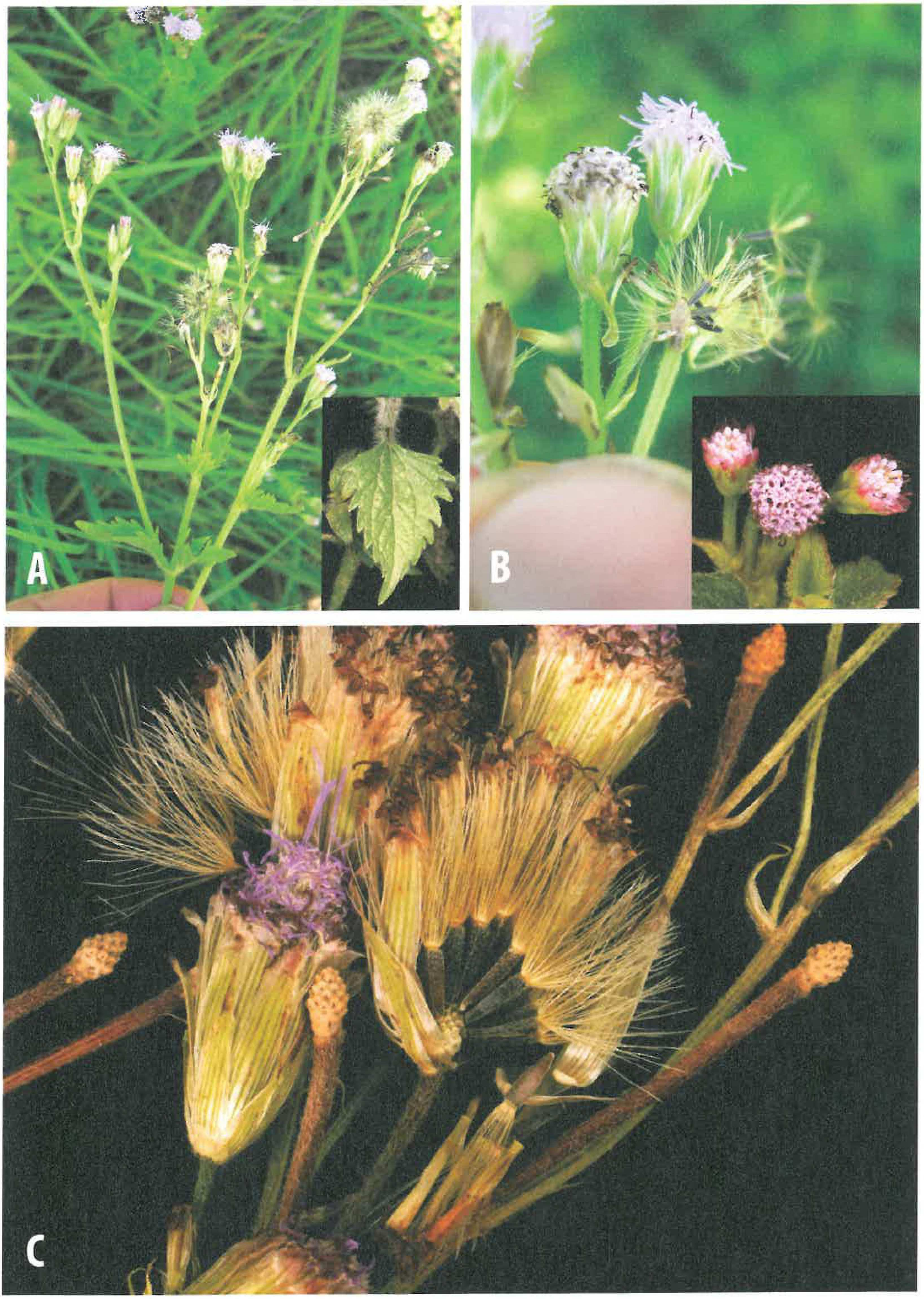

FIG. 1. *Praxelis clematidea*. **A.** Inflorescence structure with inset of leaf. **B.** Close-up of flowers. **C.** Close-up of heads showing conical receptacle.

ARTIFICIAL KEY TO DISTINGUISH *PRAXELIS CLEMATIDEA* FROM SIMILAR GENERA IN NORTH AMERICA NORTH OF MEXICO

1. Receptacle conical (usually strongly so).
  2. Pappus lacking, coroniform (flat scales fused into a crown-like structure), or of 5–6 flattened scales (sometimes 5–6 tapering setae in *A. conyzoides*) **Ageratum**
    [20–125 florets; 30–40 phyllaries, (sub-)equal, persistent; *Ageratum* stems are sometimes decumbent; only 4 spp. in North America, 3 are discussed below, the fourth, *A. corymbosum* Zucc., occurs in AZ and NM].
  2. Pappus of capillary bristles; bristles more than 20.
    3. Bristles ca. 30; florets 35–70+; phyllaries ca. 25, subequal, persistent **Conoclinium**
      [3 spp.; 1 discussed below, the other 2 are *C. dissectum* A. Gray of TX, AZ, and NM and *C. betonicifolium* (Miller) R.M. King & H. Rob. of TX].
    3. Bristles ca. 40; florets 25–30; phyllaries 15–25, unequal, deciduous (absence apparent in fruit) **Praxelis**
      [13 spp. besides *P. clematidea*, all known only from South America].
1. Receptacle flat to slightly convex (rarely very shallowly conical in *Fleischmannia*).
  4. Phyllaries deciduous, 18–65, unequal; bristles ca. 40; florets 6–75 **Chromolaena**
    [only 4 spp. in North America, 3 discussed below, plus *C. bigelovii* (A. Gray) R.M. King & H. Rob., a shrub of TX]
  4. Phyllaries persistent, 20–30, unequal (to rarely subequal); bristles 20–40 (rarely 0 or 5), florets (10–)15–25(–50) **Fleischmannia**
    [only 2 spp. in North America, 1 discussed below, the other is *F. sonorae* (A. Gray) R.M. King & H. Rob. of AZ & NM]

Despite superficial macro-morphological similarity, the genera in the above key are from several different subtribes and do not form a clade (Schilling et al. 1999; Schmidt & Schilling 2000): Ageratinae (*Ageratum*), Fleischmanniinae (*Fleischmannia*), Gyptidinae (*Conoclinium*), Praxelinae (*Chromolaena* & *Praxelis*). Most North American regions don't have more than one or two of these *Praxelis* "look-alikes," but a total of eight species in all four genera is present in Florida: *Ageratum conyzoides* L. (native to tropical America; rare exotic in southern Florida), *A. houstonianum* Mill. (native to Mexico and northern Central America; occasional exotic in central and southern Florida), *A. littorale* A. Gray (rare in the keys; vegetatively glabrous, unlike most individuals of the other taxa here), *Chromolaena frustrata* (B.L. Rob.) R.M. King & H. Rob. (rare in southern Florida), *C. ivifolia* (L.) R.M. King & H. Rob. (native to tropical America; rare exotic in central Florida), *C. odorata* (L.) R.M. King & H. Rob. (occasional in southern Florida), *Conoclinium coelestinum* (L.) DC. (common throughout), and *Fleischmannia incarnata* (Walter) R.M. King & H. Rob. (occasional in northern and central Florida). In central Florida where *Praxelis* is now known, the most similar species to *Praxelis* that are most likely to be encountered are *Ageratum houstonianum*, *Conoclinium coelestinum*, and *Fleischmannia incarnata*, although *Chromolaena odorata* is also a possibility. See the following appendix for supplemental descriptions of taxa similar to *Praxelis*.

APPENDIX

SUPPLEMENTAL DESCRIPTIONS

The following descriptions are based on field and herbarium observations. This information supplements descriptions in Cronquist (1980) and FNAEC (2006b). All of these species are very different looking when placed side by side. These generalizations are designed to capture the important macroscopic differences and are offered here to facilitate preliminary field diagnoses. *Ageratum conyzoides, A. houstonianum, Praxelis clematidea,* and some individuals of *Chromolaena odorata* and *Conoclinium coelestinum* are conspicuously hairy to the naked eye (primarily just on the uppermost stem in the latter two). The hairs in *Fleischmannia incarnata* and many individuals of *Chromolaena odorata* and *Conoclinium coelestinum* are small enough and sparse enough to escape detection by the untrained naked eye. *Chromolaena* flowers are often a very pale bluish with the overall head having a whitish appearance due to the whitish phyllaries (except for the conspicuous green striations from the veins), *Fleischmannia* flowers are often whitish with only a pinkish or bluish tinge, and the others (*Ageratum, Conoclinium,* and *Praxelis*) are generally a stronger bluish purple, although all species can rarely be white flowered. All of these taxa have a resinous odor (probably largely due to secondary compounds in the glands, which are often visible with magnification, on the lower leaf surface and other structures), but apparently, *Praxelis* has a much harsher, cat-urine-like odor (Waterhouse et al. 2003).

Ageratum conyzoides and **A. houstonianum** (virtually identical in overall appearance, at least to the naked eye).—Petiole very short, less than 1/4 blade length, to nearly as long as the blade; blade mostly broadly ovate, rounded to truncate or cordate at the base (sometimes with a small cuneately narrowing wedge of tissue at the apex of the petiole, but the blade rarely with a cuneately based appearance, except when the blade is more narrowly ovate); blade often nearly as wide as long; margin mostly very regularly, evenly, and shallowly crenate-serrate; heads more or less subglobose, often wider than tall (ca. 8–9 mm wide, 6–7 mm tall), in dense clusters; phyllaries not quite 1 mm wide, more or less flat (apex very narrowed, somewhat involute), fairly imbricate (sometimes small gaps between them in fruit), not conspicuously striate (although the pale whitish veins do stand out against the green phyllaries on some specimens).

Chromolaena odorata.—Petiole relatively short, generally only 1/4–1/3 (sometimes to nearly 1/2) the blade length; blade broadly to narrowly ovate, sometimes lanceolate, mostly cuneately narrowed at base (sometimes this is present as a large triangular wedge below the rounded to truncate broader portion); blade highly variable, from ca. 1/3 to more than half as wide as long; margin often coarsely, irregularly toothed, but the teeth can be shallow and fairly regular, or the blade may be entire; heads strongly cylindrical, much longer than wide (ca. 3–5 mm wide, 8–12 mm long), not in dense clusters; phyllaries about 1 mm wide, flat, densely imbricate, with conspicuous green striations from the veins.

Conoclinium coelestinum.—Petiole generally 1/4–1/2 the blade length; blade ovate to bluntly triangular, cordate to truncate at the base (sometimes with a small cuneately narrowing wedge of tissue at the apex of the petiole, but the blade rarely with a cuneately based appearance); blade more than half as wide as long (smaller leaves are usually almost as wide as long); margin regularly serrate to nearly dentate (sometimes coarsely toothed, sometimes very shallow and nearly crenate); heads more or less subglobose (ca. 4–5 mm wide and 3–4 mm tall), mostly in dense clusters; phyllaries very narrow (much less than 1 mm wide), almost acicular in appearance, very loosely imbricate, with conspicuous gaps between them, even in flower, not striated.

Fleischmannia incarnata.—Petiole often as long as the blade or longer (sometimes only 1/2 or 1/3 as long); blade mostly sharply triangular, sometimes blunt or ovate, mostly truncate at the base (sometimes rounded or with small cuneately narrowed wedge of tissue at apex of petiole); blade mostly more than half as wide as long; margin regularly dentate (sometimes with larger irregular teeth near base, sometimes with shallower rounded serrations, sometimes subentire, especially on upper stem); heads more or less subglobose (to ca. 6–7 mm wide and tall), clusters mostly fairly lax (few heads, not densely packed); phyllaries ca. 0.8–0.9 mm wide, flat, loosely imbricate, with conspicuous gaps, at least in fruit, not conspicuously striated (although veins quite clear with 10× magnification).

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